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ABSTRACT

More than 100 years have passed since the death of Uno Cygnaeus (1810-1888), the father of Finnish folk schools and pioneer of educational arts and crafts. His accomplishments include design and organization of the folk school system, initiation of high class teacher training, and emphasis on the importance of women's education. Although his academic discipline was theology, the basis for his educational theory shows the influence of classic authorities on education and international studies. The contents and aims of his teaching must be understood as reflections of the time rather than as eternal truths. Research in teacher training has a good start in Finland. Historically, the Teacher Education Department of the University of Jyvaskyla has had a central role in development of teacher education in Finland. The training sets used by all teacher training colleges and schools since 1912 have been abandoned with the introduction of the comprehensive school system in the 1970s. Over the years, the facilities, materials, tools, instruments, and machines available to teaching handicrafts have improved. Basic courses in technical handicrafts offered by Finnish teacher education institutions teach wood, metal, and plastic products. The latest trend in handicrafts teaching as part of general education is technology education. One objective is to help the pupil gain competencies needed in coping with everyday life, job assignments, and hobbies and to guide him or her towards post-compulsory education. (124 references) (YLB)

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THROUGH EDUCATION INTO THE WORLD OF WORK

Uno Cygnaeus, the Father of Technology Education

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PREFACE

As compared to some other great men in Finnish history, relatively little has been written about Uno Cygnaeus, who distinguished himself as the founder of Finnish folk school and particularly as a pioneer of handicrafts teaching. Nor did he himself write as extensively as, for example, many other school reformers in Europe. Nevertheless, there is today a broad awareness and general recognition of the forward-looking and far-reaching quality of the ideas he expressed.

After Dr Jouko Kantola had, in 1997, published and successfully defended his dissertation *Cygnaeuksen jäljillä käsityönopetuksesta teknologiseen kasvatukseen* (In Cygnaeus' footsteps from crafts teaching to technology education) at the University of Jyväskylä, there arose the idea of organising a conference that would, under the name of Uno Cygnaeus, focus chiefly on discussing the international and Finnish trends in technology education. Seminaarinmäki in Jyväskylä, with workrooms and museums holding a collection of objects and pictures that richly illustrates the history of handicrafts teaching, was a natural choice for the venue.

The proceedings of the conference were given a festive start by the examination on 3 July 1998 of a dissertation by Dr Matti Parikka, *Teknologiakompetenssi – Teknologiakasvatuksen uudistushaasteita peruskoulussa ja lukiossa* (Technological competence – reform challenges in technology education in comprehensive school and upper secondary school). Both Kantola and Parikka are lecturers in technical subjects at the Department of Teacher Education of the University of Jyväskylä, having previously held similar posts also in other teacher training colleges and departments of teacher education. The titles of their theses alone reveal their strong commitment to developing further Cygnaeus' tradition of handicrafts education. Such aspirations are given additional impetus by the decision to make technology education one of the priority areas in developing the University of Jyväskylä. This is another acknowledgment of Uno Cygnaeus' pioneering work, showing that it has not been forgotten after his death 110 years ago. Today's reformers base their arguments for new innovations in the field of technology education on social grounds: the development of

information technology, equality between sexes, ecological values and so on. The influence of such factors may be seen in nearly all areas of life.

The work of planning and writing this book went on alongside the preparations for the international conference held on 4–8 July 1998. We hope that the book will find itself a place in the literature on Cygnaeus. After all, in its own way it supplements the work published a decade ago (1988) by Professor Veli Nurmi, *Uno Cygnaeus – Suomalainen koulumies ja kasvattaja* (Uno Cygnaeus – A Finnish schoolman and educationalist), which is a description of Cygnaeus' life's work as a whole. Nurmi also discusses handicrafts education in four pages, concentrating, "from the perspective of formal education, that is, education to develop an individual both physically and mentally", on Cygnaeus' idea about fostering general dexterity.

The intensive development of technology has made necessary a reappraisal of the perspective of "educational handicrafts". New tools and new materials are a natural aspect of this discussion. It may be assumed that it depends crucially on today's teachers and educationalists what kind of relationship there will emerge between national handicrafts culture and these new possibilities.

The present book is a more concise version of the main work in Finnish, an abridgment considered by its writers to serve an important function in the international exchange of educational information. The first chapter was written by Dr Pentti Nikkanen, Senior Researcher at the Institute for Educational Research, and Dr Tapani Kananoja, a long-time Senior Inspector with the former Finnish National Board of General Education and, later, Associate Professor at the Department of Teacher Education of the University of Oulu. The chapter considers Uno Cygnaeus' development and international links and attempts to demonstrate his status as a pioneer of educational handicrafts. Dr Jouko Kantola has written chapters 2–4 to make his thesis, mentioned above, more accessible to readers. The book's most central themes include the development of handicrafts education in-folk school and comprehensive school in Finland and a discussion of technology education. Developments in teacher training and special local features also receive attention.

The main work contains abundant illustrations of the Finnish tradition of handicrafts accompanied by captions in Finnish and English. We would thus like to see this condensed account of the most essential contents of the main work preserve a close physical link with its parent publication.

The editorial committee thanks the Ministry of Education for a grant towards the book's publication and the Institute for Educational Research of the University of Jyväskylä for designing the publication an elegant format. Thanks are also due to Päivi Koivu for skilfully photographing and processing the majority of the book's picture materials. Those who helped the writers with translating the separate book-

let into English include Anya Siddig, Pauliina Kortesuo and Hannu Hiilos among others. We further wish to thank Professor Ron Hansen from the University of Western Ontario, Canada, for checking the proofs and for his pertinent suggestions for improving the text. We warmly thank all the above individuals as well as the other people who have, in one way or another, contributed to the writing and publication of this book.

Jyväskylä, Father's Day, 8 November 1998.

Jouko Kari

1 Uno Cygnaeus

1.1 Uno Cygnaeus – pioneer of educational arts and crafts

A even number of years, 110 years, have passed since the death of Uno Cygnaeus (1810–1888), the father of Finnish folk school and pioneer of educational arts and crafts (handicrafts). In order to achieve a broader understanding of the inheritance of Uno Cygnaeus – he was raised through work to work – brief selections from several sources, especially Nurmi and Salola, are briefly presented here to illustrate his personality, family background, education and other aspects and events linked with his life's work. Scholars are still fascinated by Cygnaeus.

Family background and career

Cygnaeus was born in Hämeenlinna. After the death of Uno's father (1819) his childhood home became the family-owned estate in Leppäkoski, Janakkala, near Hämeenlinna. His mother moved there with five children. Uno attended lower secondary school (*triviaalikoulu*) in Hämeenlinna (1821–27), graduated from the University of Turku (1827), was awarded a Master's degree from the Imperial Alexander university in Helsinki (1836), achieved excellent grades in his ordination examination in the Spring of 1837, after which (1837) he was ordained as a priest in Turku. During his first years in Viipuri (1838–39) Cygnaeus worked as an assistant to the parish minister, prison chaplain and schoolteacher. In 1839–45 Cygnaeus founded a Lutheran church on the island of Sitka in Alaska and worked there as a pastor. Uno Cygnaeus was chosen as the Chief Inspector of Folk Schools in 1861. He served as the first director of Jyväskylä Teacher Training College in 1863–68. When the Board of Education (*Kouluylihallitus*) was founded in 1870, Cygnaeus moved to Helsinki and took up full-time duties as Chief Inspector of Folk Schools.

International experiences as an enrichment of Cygnaeus' thoughts

Cygnaeus left for Sitka, Alaska as a pastor and naturalist in 1839. The ship's ports of call were Copenhagen, London, Rio de Janeiro and Val-

paraiso. After 5 years of serving as pastor in Sitka he undertook a world tour, returning eventually to Finland. The return journey through Siberia took over 6 months. During his time in St. Petersburg Uno Cygnaeus met or became otherwise acquainted with several people who were interested in educational issues. He also became familiar with educational literature, especially with the works of Pestalozzi, Fröbel and Diesterweg. On a study trip abroad in 1857–58 Cygnaeus travelled through the Scandinavian countries, Germany, Austria, Switzerland and Holland, his intent being to discover to what extent handicrafts teaching was being used successfully for educational purposes and how it was organised in the successful cases. Due to his trip Cygnaeus became more convinced than ever of the need for popular education.

ACCOMPLISHMENTS

Cygnaeus' greatest work was the founding of Finnish folk school. In his thesis for his Master of Arts degree, *The slöjd system: A Scandinavian contribution to education with special reference to Britain* Whittaker demonstrated the significance of Cygnaeus' work beyond the borders of Finland. He wrote amongst other things the following: "It was an attempt to make educational arts and crafts the main factor of the school's improved curriculum and to use it as a formal, general and non-vocational educational basis. The leader of the movement was at first a Finn, Uno Cygnaeus. Later ... the Swede Otto Salomon built it up into a system."

Feirer and Lindbeck wrote in an article in *Industrial Arts Education* that Cygnaeus made the first clear distinction between the idea of textile and craft design schools and arts and crafts or handicrafts as a school subject. According to them one of Cygnaeus' main driving principles was that arts and crafts must become an integral aspect of folk school. Although Feirer and Lindbeck thus credited Cygnaeus for defining arts and crafts as a school subject, they nevertheless wrote at the same time that educational arts and crafts was born in Nääs in Sweden in 1868. A little later on in their article they claim the following: "...It was during these times that Salomon travelled to Finland and met Cygnaeus from whom he picked up information on the pedagogical value of arts and crafts". Obviously the researchers in question were not able, however, from the perspective they adopted in their article, to objectively evaluate and prioritise Cygnaeus' part.

Cygnaeus stressed the necessity of arts and crafts teaching based on pedagogical principles: "...I see it as an indisputable necessity that folk-school children, and that includes the pupils of the Teacher Training College, are given an opportunity to acquire an overall dexterity that is in keeping with a general layman's grasp of geometry and natural science, that is, an ability to perform, using all kinds of tools and implements, tasks requiring some skill (...) A competent schoolteacher does not need to be an all-

round artisan, but as I see it, he or she should be able to improve the pupil's general manual dexterity, which, when supported by the corresponding natural science, will no doubt serve as a powerful improver of the people's education and prosperity".

OPPOSITION AND UNDERESTIMATION

When he was alive, Cygnaeus' ideas were often opposed and underestimated: firstly, the model set by the Nääs Woodwork Teacher Training College in Sweden was finding faithful followers. Salola wrote with regret that "It is however a shame that the Finnish Economic Society has so forgotten its own country's honour that it advances the cause and interests of Nääs". Secondly, all the credit for the work of developing the field was going to the Swede Salomon and the Dane Clausson-Kaas. Thirdly, although Cygnaeus had paved the way so that it would be in Finland that the teaching of arts and crafts would first be used successfully for the purposes of education, he soon noticed that the educational principle involved in arts and crafts teaching was forgotten. Instead there was often an ambition to achieve professional outcomes, and the external result was emphasised regardless of how much of it was actually derived from the pupil's own work. Cygnaeus' worries were also increased by the fact that the Finnish Economic Society had, as if in competition, taken up also the cause of woodwork, pursuing aims, however, that Cygnaeus thought totally wrong. That is, the aim was not to use handicrafts as an educational tool but, instead, to promote home crafts. Fourthly, both Snellman, a great philosopher who had held a chair in education, and Cygnaeus, a theologian, had their plans for how popular education should be organised in Finland. According to Ojakangas, however, Snellman was astonished to find that his plan received little attention and he perhaps felt that his territory had been invaded.

HONOUR WHERE HONOUR IS DUE

As Fridolf A. Salola points out, "Cygnaeus was sometimes in very low spirits". However, despite all the setbacks the value of his work has endured. Salola wrote that according to the German Langen "it was in Finland that the idea of arts and crafts first appeared and was put to practice in 1863, not in Sweden or Denmark. Let neither the Swedes nor the Danes take themselves a glory that does not belong to them; those fine gentlemen (Salomon, ClaussonKaas) want to take away the recognition from the one to whom it really belongs...". In his book, Nurmi describes the relationship between Cygnaeus and the Swedish Salomon as on the one hand "becoming at a stage quite problematic", but on the other hand he also points out that "he (Cygnaeus) made some acknowledgement of Salomon's contribution". Cygnaeus saw with pleasure how the idea of educational arts and crafts

(handicrafts) was gaining ground, but when Nääs became increasingly influential there was some cooling in the relationship between him and Salomon. Whittaker surmised in his thesis that "In any case, the *slöjd* system has engineered such significant visible effects on the development of education in Europe and America that Cygnaeus' personal international significance as a pioneer of education cannot be called into question".

In his biography of Cygnaeus, Nurmi ponders on who or what in the end brought Uno Cygnaeus forward as the organiser of Finnish folk school. Nurmi concludes that the final result was the outcome of many factors. They included, for example, Cygnaeus's own desire to get out of St. Petersburg, the help of influential friends, his personality, his pedagogical capabilities, his enthusiastic and active pursuit of his goals and careful attention to detail and his knowledge of languages. His quite broad education and trips abroad may have been important contributing factors. Continuing his discussion, Nurmi stresses particularly such underlying factors as Cygnaeus' liberal ideas and the support given by the Minister State Secretary, Alexander Armfelt.

This great man of Finland, Uno Cygnaeus, designed and carried out the organisation of the Finnish folk school system and initiated high-class teacher training. His ambition to create a common basic education has now been achieved through the introduction of comprehensive school. He also emphasised the importance of educating women. Cygnaeus was a notable educationalist who improved the curriculum. Cygnaeus, who saw the link between school and economic life, considered the skills of the ordinary person inportant, not only because his father had valued manual dexterity but also due to the experiences he had gained when building the church in Sitka. Today Cygnaeus' work has been recognised. Although things and events are always tied to their historical context, one can still even today, like Nurmi, concur with Soininen's following judgment, expressed in 1910: "More than anyone else, Cygnaeus has helped us to equip our people for its future destinies".

1.2 The international experience of Uno Cygnaeus and the development of handicrafts education in the Nordic countries

Uno Cygnaeus (1810–1888), the father of Finnish folk school, was a man of the world; he trained as a priest, studied theology, science and history, communicated in several languages, and worked extensively abroad. He quickly learned the importance of adapting to new circumstances and became innovative, diligent, and persevering.

Finland, the starting point for Cygnaeus, was a remote corner of the big Russian empire. Such a location was not suitable for supporting the international base that ultimately influenced his thinking and work. The 19th century, however, was a period in which international opportunities presented themselves; Finland created its cultural and economic heritage and the basis for its independence during this period. A precondition for Finland's independence was an important network of relations with other countries. The few cultured people, for example Snellman and Cygnaeus, were well known in Europe, and their work was supported.

The timing for an institutionalisation of education for work was appropriate. National universal education systems were emerging. The beginnings of industrialisation were evident. 'Work education' was started in many countries according to ideas being developed at the time, although such ideas were, by the year 1900, already under development in the Nordic countries. Cygnaeus, the creator of handicrafts education, had written extensively about his ideas (Laurila, Ottelin, Salo, Harni, Gladh, Jussila, Kananoja, Kantola and Autio).

THE INFLUENCE OF INTERNATIONAL STUDIES ON CYGNAEUS

Cygnaeus developed the basis for his educational theory through independent studies. His academic discipline was theology, although at that time education as a scholarly subject had a close relationship with theology and philosophy. In St. Petersburg Cygnaeus became acquainted with the classic authorities on education. These classics provided the basis for a breadth in his educational thinking. Cygnaeus acknowledged himself to be a follower of Pestalozzi, Fröbel and Diesterweg. He discussed the new trends in education with a Petersburgian educationalist named Paulson, who later on became a long-term penfriend. Handicrafts was taught during the 1830s in the Petri School, a school for Finnish children in St. Petersburg. Handicrafts gained further recognition in 1856 when Cyg-

naeus began to see how education and work could be purposefully connected.

Cygnaeus' childhood training in woodwork would play an important part in his development. In Alaska Cygnaeus put these technical skills to use. For example, he designed and constructed a church and a school for his congregation. His respect for handicrafts education may have deepened as a result of such experiences and skill development. During this time Cygnaeus continued to expand his educational thinking. He would purchase and read educational literature all the time, ultimately adding it to the collection of the library of the Russian Trading Company.

Cygnaeus' correspondence was vast. The library of the Department of Education, University of Helsinki has a collection with hundreds of copies of Cygnaeus' letters or drafts from 1859–1888, and of the letters he received; and there is more in the National Archives and in private archives. His international correspondence collection included letters to and from Finland and St. Petersburg, Alaska, and from his travels through Siberia, such as letters in written 1845 from the Ohota Sea and the Lena river. The letters were written to and by family members and former students who needed support for their work as well as to and by political decision-makers back in Finland and foreign colleagues. Some of the letters were preparation for his own or his students' or future lecturers' study tours. Among family members the letters were exchanged between him and his mother, cousin (Fredrik) and sister (Johanna). After his marriage his private correspondence was mostly with his spouse Axianne; discussing travel and work arrangements. These letters were personal and tender. His correspondence with his former students is described in several Finnish studies. The content of the letters focused on local or regional problems involved in launching the Finnish school system or handicrafts education. Cygnaeus' political influence extended to senators, the cultured people (such as Topelius), committee members and other influential persons (eg Tikkanen). This national correspondence is not further discussed here.

Amongst his friends and colleagues in Sweden, Meijerberg, Hedlund and Siljeström were (around 1859–1880) continuously in correspondence with Cygnaeus. In 1877–1887 there was a great deal of contact with Otto Salomon, who created the handicraft education system in Sweden. Both of them visited each other in order to become familiar with the work done in the neighbouring country. Cygnaeus sent Finnish students to participate in Salomon's courses. Many textile handicrafts teachers trained in Jyväskylä were invited to work in Nääs, the municipality in Sweden where Salomon began training others in teaching handicrafts. They were highly regarded. Thorbjörnsson has also mentioned Cygnaeus in his research on Salomon.

Cygnaeus' influence also reached other countries, for example Iceland, England, and, through Salomon, Denmark (Mikkelsen), Nor-

way (Kjennerud), and the USA (Larsson). Handicrafts education in Denmark and Norway stemmed from courses at Nääs . Mikkelsen and Kennerud, among others, studied in Nääs. Cygnaeus visited all the Nordic countries but was not satisfied with the way in which handicrafts education had been implemented in them. He soon became familiar with the handicrafts education systems of Central European countries.

The Wettingen Teacher Training College in Aargau, Switzerland, was an important training institute for the future Finnish teacher trainers. Cygnaeus had contacts there in the beginning of the 1860s. On the 14th of June 1861 Cygnaeus wrote in a letter to his four aspiring lecturers about technology as a school subject ('...*Ahlmann zum Lehrer im Zeichen und Technologie*'). In Bern, Switzerland Cygnaeus also discovered a girls' school. Correspondence with the principal, Fröhlich, continued for a long time.

Germany and Austria were also important sources for Cygnaeus. Familiarising himself with the programme of Fröbel and the work of Diesterweg in Berlin and of Georgens in Austria provided further basis for his own thoughts. However, Cygnaeus wrote that he was not totally satisfied with the German educational practice. Wilfried Lange in Berlin remained an important contact and friend. Lange mentions Cygnaeus as the teacher of Salomon. Pabst also wrote about Cygnaeus as the pioneer of handicrafts education. Later on in Germany, Kaiser, Raapke, Reincke and Wilkening wrote extensively about the high regard they had for Cygnaeus' work.

In England practical education was already being provided on the basis of the ideas of John Locke. The changes in material culture, in the production of artefacts, brought about by industrialisation, induced William Morris, an interior decorator and John Ruskin, a philosopher, the philosopher Ruskin to collaborate in developing handicrafts education. It was mostly their initiatives that gave rise to the Arts & Crafts movement in the UK, influencing the development throughout the world. The position of Cygnaeus as an influence on the development of handicrafts education in England has been studied by Whittaker. According to him, the type of handicrafts (*slöjd*) education originally initiated by Cygnaeus began in the UK in 1886.

Cygnaeus' influence reached the United States when Mr Larsson, who had been trained by Otto Salomon, moved to the US. Larsson founded in 1888 the Boston Sloyd School, which disseminated the new ideas. This institution is still regarded as an important element of technological education in America. The inputs of Dewey and Kilpatrick were naturally based on the then topical global trends, one of the most important of them being the sloyd movement begun by Cygnaeus. Olson, one of the first American researchers writing about technology education, regards Cygnaeus' work quite highly.

The historians of education in Poland, Hungary, Greece and Japan also refer to Uno Cygnaeus. Tadeusz W. Nowacki writes about Uno

Cygnaeus in *Praca i wychowanie* ('Work and education', Warszawa 1980, 57–58): '...amongst the various pedagogical ideas current in the 19th century emerged a very original handicrafts education system (craft – '*slöjd*'). It was started by a Finnish educational reformer, Uno Cygnaeus. According to him, handicrafts is one of the main school subjects, necessary for the education of an independent and rational human being. – After being trained in Finland (?) Otto Salomon (supported by August Abrahamsson) founded a handicrafts teacher training college in Nääs, Sweden, where he training teachers. Together with the other reformers of handicrafts, such as the Danish Clauson-Kaas and Mikkelsen, he issued a statement asserting that handicrafts is the best way to train children and young people in independence, various skills, good management of work, and accuracy and patience. These students were also taught to value work. Educators in Poland felt that handicrafts education had a positive influence on learning in other subjects in the Polish schools.' – Similar findings are mentioned in the writings of Henryk Rowid in *Szkola tworcza*, ('Creative school', Warszawa 1958).

In Iceland in 1890 the country's first Director of Education wrote early in his career (in an article titled 'School industry'), how school handicrafts must be different from home crafts. He believed in schooling as a preparation for work. Such preparation had a significant educational function. A pedagogically trained teacher, he believed, was able to understand this function, more so than a craftsman. The article referred to other authorities or work education and to how Uno Cygnaeus developed the idea of such education and how it spread to other countries.

In Japan, Matsuzaki describes Cygnaeus as the father of handicrafts education. Toshiaki Endo, Kunihiko Ikebe and Etsuo Yokoyama have recently visited Finland and Linköping in order to acquaint themselves with the subject. The literature on the history of education, such as Brubacher, Grue-Sörensen, and Myhre, further emphasizes the importance of Cygnaeus' work.

THE DEVELOPMENT OF HANDICRAFTS EDUCATION IN THE NORDIC COUNTRIES

In the Finnish schools Cygnaeus' influence was immediate. However, his original contribution was not acknowledged as immediately as in the other Nordic countries or elsewhere. The literature on the history of education suggests that Cygnaeus was the initiator and developer of handicrafts education while Otto Salomon was the skillful marketing manager of the idea.

The school reform carried out by Cygnaeus did not mean only the introduction of handicrafts. He strongly emphasised the moral and social aims of education. Improving the status of women, emphasising the role of home in children's upbringing and the idea of universal compulsory education were the core of his pro-

gramme. Fröhlich (1861; letters) writes aptly about Cygnaeus'programme: 'In Finland the question is not about reforming the school but actually about achieving a totally new creation (*Schöpfung*)'. Allingbjerg, who after Mikkelsen acted for ten years as the principal for the sloyd school in Copenhagen, writes about the Nordic innovators of handicrafts education and mentions Cygnaeus as the first one who used the term '*slöjd*'.

THE BEGINNING OF HANDICRAFTS EDUCATION IN DIFFERENT COUNTRIES

(1) Salomon started, in Sweden, the Nääs Handicrafts School in 1872. In 1874–77 the school became a folk school with handicrafts in the programme. The lively correspondence between Cygnaeus and Salomon in 1877–1887 is marked by a lengthy discussion about the meaning and function of handicrafts in school. Folk school was founded in Sweden in 1842; In Finland in 1866. Cygnaeus expressed his disappointment about the lack of handicrafts education in Sweden and in the other Nordic countries, and about his message not always being understood. In 1877 Salomon visited the Jyväskylä Teacher Training College, and Cygnaeus visited Sweden in 1858–59, 1866, 1868 and 1878, when he was given a Honorary Doctorate in Education by the University of Uppsala.

Salomon and Cygnaeus agreed about the importance of handicrafts in education. They disagreed about the position of handicrafts in school. Salomon founded 'handicrafts schools'; Cygnaeus considered them vocational schools and wanted handicrafts as a subject equal to the other subjects in folk school. The fight continued for a long time. However, agreement was reached later on; finally Salomon wrote: "It is an ardent hope of mine to be granted the honorary status of belonging to the school of Uno Cygnaeus". Salomon is known for his method, which was quite vocational, having a series of working skills and artefacts as the basis. Such an emphasis, according to Cygnaeus, would prevent its adoption as part of the (comprehensive) folk school ideology.

Salomon published a newsletter, *Slöjdundervisningsblad* ('Sloyd Education Newsletter'), where he led the Swedish discussion about the development of handicrafts education. In 1885–1902 a total of 212 newsletters were published. Salomon's sloyd system became known in the whole world because of his courses and the booklets published in many languages. It was the first systematic didactic (pedagogical) programme of handicrafts education and was based on the heritage of the old authorities on education.

After Salomon, Swedish handicrafts education experienced some changes in the 1920s, when Carl Malmsten (1888–1972) organised his courses at Nääs. Malmsten was a interior designer and did not approve of the strict model series advocated by Salomon. His idea was to allow pupils to create their own designs, to be more

creative. This idea was continued in Sweden by Thorsten Lundberg as the principal of the Lindköping Teacher Training College from the 1960s up to the 1980s. Like Malmsten, Lundberg was a interior designer.

The 1962 curriculum in Sweden introduced a new school subject, technology, '*teknik*', based on modern technology, to support handicrafts. It is still (1998) taught as a separate subject in Sweden. In the beginning of the 1990s the Ministry of Education tried to make handicrafts an optional subject and technology an obligatory one. It did not, however, succeed because of an extensive political debate organised by the teachers. As a result, the weekly period allocation for handicrafts was reduced and also technology became a compulsory and integrative subject.

(2) In Denmark Meldgaard completed a course organised by the Danish Home Crafts Association. He started as a teacher in 1879, and introduced handicrafts education in his school. In 1882 he attended a course in Nääs and started to apply the things he had learned in Sweden in his work. Meldgaard founded in 1886 Askov Handicrafts Education School. In 1887 and 1890 Meldgaard again visited Nääs. Salomon, in 1891, visited Askov. The collaboration was thus continuous.

Aksel Mikkelsen, another Danish developer of handicrafts education, belonged to a family of craftsmen and owned a metal workshop. He instructed his workers in handicrafts, produced handicrafts equipment and tools, visited Nääs, Gothenburg and Norway (1882), founded a handicrafts school (1883) and a teacher training institute in Copenhagen (1885) and wrote books about handicrafts education. He is thought of as the creator of Danish handicraft education. He later founded a sloyd institute in collaboration with Salomon.

Allingbjerg writes that Mikkelsen's '*fysikslöjd*' enjoyed much success. Mikkelsen's 'manifesto' (1895) asserted that 'the aim of handicrafts education is not to educate craftsmen but to make pupils generally dexterous, teach them to appreciate beauty, to research, experiment and invent – to develop hand and eye'. These aims were closer, as a philosophy, to Cygnaeus than to Salomon, at least as far as Salomon's early thinking is concerned.

After handicrafts became a school subject in Denmark, two schools of handicrafts were born: the supporters of Nääs in Askov and the supporters of Mikkelsen and Danish handicrafts education in Copenhagen. The disagreements between these two schools were discussed around the turn of the century in Salomon's newsletter. The proportion of schools offering the sloyd of Askov and Nääs in the total number of Danish schools having sloyd in the curriculum developed as follows: 7,8 % in 1892; 6,1 % in 1908; 10,8 % in 1920; 15,3 % in 1930. The corresponding figures for the supporters of Danish handicrafts education were: 92,2 % in 1892; 93.9 % in 1908; 89,2 % 1920; 84,7 % 1930.

As of 1975 Danish school legislation no

longer differentiated between the two teacher training institutions in Denmark. Another illustration that the disagreements between the two Danish handicrafts schools were real is found in the fact that the period of a hundred years saw the establishment of seven different associations for handicraft teachers. Three of them are still active today (1998). In 1998 Denmark still has two teacher training institutions for sloyd. The differences between them have become smaller and the curricula have been integrated. New technology has also been incorporated into handicrafts teaching, even if technology education belongs to the science education syllabus.

(3) Norway, in 1870, had various home industry schools similar to the models in Sweden and Denmark. In Kristiania (Oslo) and in Fredrikstad there were 'work schools'. In 1875 Fredrikstad Handicraft Society was founded. Kjennerud visited Nääs in 1880 and brought with him the model series, which was applied in Fredrikstad. The tools and methodology Kjennerud brought, however, were from Denmark. He also invited Mikkelsen to teach in his school. In 1880 handicrafts was an optional subject and in 1885 it became a compulsory subject in teacher training institutions.

The Norwegian handicrafts education tradition suffered a defeat around 1959, when art educator Bull-Hansen created a new subject, called forming, which integrated handicrafts and art. Its aims or contents included no training in producing material objects; the purpose of the subject was to instil artistic and expressive abilities in students. In 1995 Norway introduced a new curriculum which reintroduced practical training in making artefacts. Technology education belongs to science as in Denmark.

(4) In Iceland Uno Cygnaeus was valued for the continuity of his work with Fröbel and as the inventor of the Nordic term '*slöjd*'. His relations with Nääs are also mentioned. At the moment (1998) Iceland is drafting a curriculum for practical education. The main content and aim of the curriculum will be 'innovation' in producing material artefacts.

SUMMING UP

The turn of the century saw a quick and decisive institutionalisation of education for work in many countries. The main reason was the founding of an universal education system. Morally oriented education for work as conceived by Cygnaeus was valued highly by societies all around the world. This was the context in which Cygnaeus succeeded in getting education for work established as a school subject. At the same time, changes in production – the beginnings of industrialisation and manufactory-production – meant that workers and citizens needed new skills. Increasing wealth brought new patterns of domestic consumption, and purchasing goods from outside the domestic

production line began to be widespread:

- (Finnish) handicrafts education, initiated by Cygnaeus (1810–1888) began as early as in the 1830s in St. Petersburg; in 1861 Cygnaeus submitted his proposal defining handicrafts as a school subject to the Finnish Senate; the new School Law (1866) institutionalised it in Finnish folk schools as a compulsory subject.
- In Sweden, Salomon (1849–1907) began his campaign for handicraft education in 1872; in 1878 handicraft (*slöjd*; sloyd) became optional in folk school, but only in 1953 was it made a compulsory subject.
- In Moscow Victor della Vos (1829–1890, the Moscow World Fair 1870) began systematic technical vocational training.
- In Germany the father of vocational education, Kerschensteiner (1854–1932), won in 1901 an idea competition with his proposals for education for work; his main contribution was the publication of *Arbeitsschule* in 1911.
- In the Soviet Union Blonski (1884–1941) began polytechnic education; his chief work was 'Arbeitsschule' in 1919; Krupskaya (1869–1939), the thesis of polytechnic education in 1929.
- In France, handicrafts education in folk schools was begun in 1873 by Salicis; in 1882 handicrafts became compulsory.
- In Denmark Clauson-Kaas founded a home industry institute in 1866; handicrafts as an optional school subject in 1903; compulsory in 1937; Meldgaard (1850–1894), trained at Nääs; programme by Mikkelsen (1849–1926).
- In Norway Kjennerud (1837–1921) created a handicrafts programme based on Nääs.

Handicrafts education was developed in each country by interested laymen. Cygnaeus was a priest and an expert in science and history; Salomon a gardener; Malmsten and Lundberg interior designers; Morris an architect, Ruskin a philosopher; Kerschensteiner a school inspector. A practical skills background as such, while it might not be enough for intellectual innovations or development, does lead to 'enjoying the skill and process itself'; it satisfies the person engaged in it.

In the Nordic countries the development of handicrafts education generally followed the same lines. The slow speed of development and the disagreements about the aims have caused problems in achieving common programmes for teaching, training or research. Basically, Cygnaeus' tradition has lived on in the Nordic curricula except for the adventurous Norwegian forming initiative.

The weekly period allocation and teacher training programmes are different in different countries. The role of new technology in the curricula varies a a great deal; technology education, which Cygnaeus had as a term as early as in 1861, inspired by developments in Germany and Switzerland, has been implemented in different ways and contexts in different countries. Some traces of integration can, however, be seen in recent developments. A look at the timetables of the innovators in the field of hand-

Table 1. Reformers of crafts teaching and reform dates.

	1850	1860	1870	1880	1890	1900	1910	1920	1930
Cygnaeus (1830-l)		1861	1866						
Salomon			1872						
Victor della Vos			1870						
Kerschensteiner						1901	1911		
Blonski								1919	
Krupskaja									1929
Salicis			1873	1882					
Clauson-Kaas			(1866)						
Meldgaard				1886					
Mikkelsen				1883					
Kjennerud				1880					
Island					1890				

(N.B. Clauson-Kaas founded an institute for cottage industry, not School Handicrafts.)

icrafts education reveals the importance of Cygnaeus as the pioneer in the field: in the history of technological education Cygnaeus has the status of the global founder of institutionalised education for work. In addition to founding universal education in Finland (folk school) he started handicrafts education and so insightfully created a good basis for the technological and economic development of the country. (Halila 1949.)

The development of handicrafts education has faced many problems. The curricula drawn up by educational authorities were not necessarily approved by the teaching corps. The reforms have, however, always slowly followed each other in order to satisfy the more and more global needs. The message of Cygnaeus must naturally be adjusted to the demands of different times; the teaching contents and aims must also be understood, in research, as reflections of the time rather than as eternal truths. In most countries teacher training is now given in universities, which has meant the emergence of an academic discipline. Research in the area has started well in Finland, where action research has allowed it, and where every teacher takes a Master's degree in education.

2 THE PREPARATION AND TRAINING OF HANDICRAFTS TEACHERS

In Finland, handicrafts teachers have, throughout the years, been trained in several locales and using a number of methods. In schools, handicrafts were first taught by folk-school teachers who had been adequately familiarized with the subject during their education. From 1863 to 1973 teachers were trained in twelve teacher training colleges, two of which had Swedish as their teaching language. The colleges were abolished in 1973 and 1974 when teacher education became organized in the Departments of Teacher Education under the Faculties of Education at the universities of Helsinki, Joensuu, Savonlinna, Jyväskylä, Oulu, Kajaani, Rovaniemi, Tampere, Hämeenlinna, Turku and Rauma. Teacher education in the Swedish language was provided by Åbo Akademi in Vaasa. Each teacher education department has a teacher training school with the necessary grades (usually comprising primary school and lower and upper secondary school). The training schools serve also as research sites. Before the abolition of the colleges the teacher training schools were called practice schools.

The teacher education system described above is still functioning. All primary-school class teachers are taught to teach either technical work or textile crafts. However, this practice varies from one teacher education department to another. For example, in Jyväskylä both technical work and textile work are included in the basic courses for teacher trainees.

The training of subject teachers of handicrafts, that is, teachers of technical work and textile crafts, started later. The training of teachers of textile crafts began as early as in 1886 in Helsinki, but training teachers of the teacher training for technical work did not start until 1963 in Rauma. A 35-credit programme in technical work for primary-school teachers began in Oulu in 1996. According to the new legislation, the teachers completing this programme qualify also as subject teachers.

2.1 The significance of Jyväskylä Teacher Training College in the development of handicrafts teaching in Finland

THE DEVELOPMENT OF HANDICRAFTS TEACHING

Historically, the Teacher Education Department of the University of Jyväskylä, originally Jyväskylä Teacher Training College has had a central role in the development of teacher education in Finland. It was founded in 1863 as a result of The Teacher Training College Act issued in 1863. The College gained established status in 1866 when the Folk School Act was passed. Jyväskylä Teacher Training College made it possible to take a degree in primary-school teaching in Finnish. The training took four years. There were separate departments for male and female students, and it was the male students who were instructed in teaching boys' handicrafts. Thus was handicrafts introduced to general education as a compulsory subject. It is probable that the Swedish term for handicrafts, '*slöjd*' was used first by Cygnaeus as it occurs in his early writings. This view is also supported by a Danish educationalist, Allingbjerg.

The 1866 Folk School Act gave no exact instructions on how to teach handicrafts. Handicrafts was not even compulsory for boys in urban schools. The aim of the subject was to improve general dexterity. Cygnaeus wanted the skills needed in woodwork, wood-turning and smith's work to be included in the curriculum. The skills of a shoemaker and a saddler were also considered valuable. The artefacts made were to have a specific use. Furniture, household utensils and agricultural equipment were included in the curriculum. However, no methodological instructions on how to teach handicrafts were given. Until the early 1880s, the curricula of folk schools were designed individually at each school, and thus they differed significantly from each other. Cygnaeus, however, emphasized the equal importance of all subjects.

The 1881 circular of the National Board of Education gave curricular instructions concerning the aims of handicrafts education. From 1870 onwards, Cygnaeus had held office as Chief Inspector of Folk Schools at the National Board of Education, and was thus able to influence the way education was developed.

In another circular in November 1883, the National Board of Education specified how the teaching of handicrafts should be arranged: schools were to make out a work plan for every term, the teaching was to be based on educational principles, and it was to proceed from simple tasks to more demanding assignments according to the pupils' skills. The aim was not to

achieve industry-level production rates or faultless skills but to develop the pupils' accuracy and tidiness and maintain order. Another important aim was to foster a refined sense of beauty; thus, handicrafts was to be based on good and versatile models. Versatility meant that in addition to woodwork, handicrafts as taught schools was also to cover other forms of craft. Local needs and resources were to be considered when choosing the models. In addition to the models, illustrative and intelligible drawings were to be used in the upper grades of folk school. Integration with both drawing and mathematics was emphasized. This stage, when handicrafts teaching was based on models, has later been named the *time of model courses*.

In 1884 a committee was set up in Finland to work out a programme for handicrafts teaching for boys in folk school. As the committee was chaired by Cygnaeus, it can be called the 'Cygnaeus Committee'. The committee had some difficulties in combining the demands of both formal and practical teaching. Formal education was considered to have primary importance, but theoretical knowledge and technical skills were also regarded as valuable. In order to increase the connections between handicrafts and economic life, the committee suggested making handicrafts teaching more versatile by introducing brush-making, basketry and working with birch-bark, cardboard, wire, and sheet metal. This was intended to give the pupils competencies valuable in promoting handicrafts as a trade. In addition to this, the Cygnaeus Committee considered it important that the pupils learned to varnish and polish at an early age. Only as an exception was it recommended to teach iron or other metal work in folk school because it was thought unsuitable for the pupils' stage of development.

The Cygnaeus Committee sat from 1884 to 1887, and in 1887 it published a report introducing *model sets* that were to replace the model courses, and were to be used in all schools. These model sets were illustrated objects that all pupils were to make in order to practise the skills they had learnt. The models were to be copied and were to be kept in the pupils' sight at all times. In addition to the basic model set there were technical drawings of additional assignments for advanced pupils. However, the drawings were meant mainly for the teacher because reading them was thought to be too difficult for the pupils in the beginning of their studies. In all, there were 70 objects, 55 of which involved woodwork. It was assumed that copying the model set would lead to an adequate level of handicrafts skill. The additional drawings were necessary as it was thought that the basic models would not be sufficient in all schools. They were also designed to give variety to the assignments. At this stage, woodturning and metalwork together with cardboard work were also included in the model sets.

It was the report of the Cygnaeus Committee in 1887 that first provided the practical preconditions for teaching handicrafts in folk school. The model sets and tools that were to be

used were theoretically organized, and steps were taken to ensure that all schools would be able to obtain them.

Although the model sets were also used in Jyväskylä Teacher Training College, the trend there was towards versatile handicrafts teaching. Cygnaeus wanted the students to work on projects that required them to think on their own when planning their tasks. Such projects included, for example, making geometrical devices and physical machines, such as levers, pulleys and pumps. Projects of this kind familiarized the students with various aspects of physics, such as power, moment and pneumatics. The importance of versatility and a technological orientation in handicrafts teaching was emphasized in Jyväskylä as early as in the 19th century. This can be seen in the name of the subject at the time, 'technical handicrafts'. On the first pages of Cygnaeus's report there is the signature of Hårdh, one of the lecturers, together with the title 'lecturer in drawing and technical handicrafts'. This may have been one way in which Cygnaeus tried to establish 'technical handicrafts' as the name for the subject, as it would have better guided the development of the subject in the direction where Cygnaeus wished it to go.

In the early 20th century it was again found necessary to reform handicrafts teaching. Society and the different industries had developed further. Especially the use of electricity created new avenues of technological development.

In 1912, the Soininen Committee proposed replacing the model sets with *training sets* that included also concise materials for metalwork, with woodwork continuing to be the main subject. All the teacher training colleges and folk schools were advised by the Soininen Committee to use these training sets. It was suggested that after finishing the compulsory artefacts teacher trainees should undertake more complicated assignments, should they have any time left.

LECTURERS IN HANDICRAFTS IN JYVÄSKYLÄ TEACHER TRAINING COLLEGE AND IN LATER TYPES OF EDUCATIONAL ESTABLISHMENT

The first permanent officeholder in handicrafts teaching in Jyväskylä Teacher Training College, and in all of Finland, was Rafael Hårdh. He held the post from 1866 to 1897, before which he had studied engineering and science at Finnish and foreign universities and higher education institutions. Hårdh emphasized general dexterity and seeing handicrafts as a means of formal education.

From 1871 to 1912, at the time of national romanticism and Finnish Jugend, the post of lecturer in drawing and handicrafts was held by Yrjö Blomstedt, who similarly valued Cygnaeus' ideas concerning educational handicrafts. Blomstedt reformed the contents of men's handicrafts teaching by increasing the amount of

design and drawing. He also introduced a ethnological viewpoint by holding up ethnological collections as models to draw on while designing artefacts. Blomstedt's idea was that by becoming acquainted with the common people's artefacts, the students would learn to value "their ancestor's folk heritage", the traditional techniques and forms.

Blomstedt was followed in the lecturer's post by Toivo Salervo, who held it in 1913–1918. Salervo had completed a Master's degree in the Department of Architecture of Helsinki University of Techology and a degree in woodwork in Sortavala Teacher Training College. When entering the post Salervo was only 25 years of age. Taking up the lectureship immediately after Blomstedt, who was talented in many fields, Salervo probably had no time or need to make major changes in the teaching. In 1918 he was nominated Male Inspector of Drawing and Handicrafts on the National Board of General Education. The same year he published a guidebook in woodwork.

Heikki Haataja served in the College as lecturer in drawing and handicrafts from 1919 to 1927. Both he and his predecessor held the post for a relatively short period of time. Haataja's period in Jyväskylä was further shortened by numerous leaves of absence. After graduating from Kajaani Teacher Training College Haataja had qualified as a drawing teacher. In addition to this, he had studied in the Atheneum School of Design, and practised among other things sculpture under professor E. Wikström. Although functionality as an objective in the design of artefacts was emerging in schools in the 1920s, it seems that 'overall artistry' was dominant in Haataja's work.

Toivo Ojala served as lecturer in drawing and handicrafts in 1928–1947. He continued the heritage of his predecessors Blomstedt and Salervo, but added some new trends to the old contents. This was also the time when the functionality of the artefacts to be made was emphasized.

Erkki Tammisola was the first handicrafts lecturer in Jyväskylä who taught exclusively handicrafts. He worked in what had become Jyväskylä College of Education from 1947 to 1977. Toivo Ojala continued as a drawing teacher until 1955. The comprehensive school system was introduced in the latter part of Tammisola's career. The name of the subject was changed to technical handicrafts. At this stage, the National Board of General Education organized some in-service training for lecturers in different subjects. It was through this training that Tammisola became familiar with the creative influences of the time.

Preparing for the comprehensive school initiated change also in the teacher education departments. In Jyväskylä, the model sets were abandoned in handicrafts towards the end of Tammisola's period of service. Since then, the students have been themselves allowed to decide how to practice their techniques and skills. The last vestiges of the old system disappeared in the early 1970s with the introduction of what is known as the theme work method.

Later on, mechanics, electricity, machinery and electronics were added to the contents of what today are the minor-subject studies in technology / technical work offered by the Teacher Education Department at the University of Jyväskylä. A more diverse range of metalwork is also covered. To keep within the time limits, there has been a corresponding reduction in the amount of woodwork.

In 1989 technical work, as a result of prolonged efforts, was moved to its own facilities in the middle of the Jyväskylä campus. Especially since then, new technology (eg the use of different computer-aided devices) has been added to the contents of the subject. At the same time, the aim is to integrate the teaching with mathematics and science. The name of the subject, technology / technical work, indicates the new perspective.

During the present decade a new curriculum of technology education has been developed in the Technology Education Section of Jyväskylä Teacher Education Department. It has been considered an important issue by the whole university. A Technology Education Team has been working at the Faculty of Education discussing the contents and orientation of technology education. The team considers it necessary to make technology education one of the core subjects in the whole university, especially in the Teacher Education Department.

In 1993 the operation of Jyväskylä Teacher Education Department was evaluated by an international team representing the quality inspection project Teacher Quality / Teacher Education Programme Review organized by OECD/CERI. The team found that the curriculum of the Technology / Technical Work Section met the international criteria, and was of high quality.

An extract from the report states: 'The department of technology and design is very well equipped with most modern technology (eg CNC machines). Within an integrated programme a modern curriculum of technology education can be offered to the students. The active participation of the lecturers in international projects on technology as well as design education and the high level of qualification of the lecturers might be seen as main reasons for this programme of high quality.'

2.2 Other teacher training colleges and teacher education departments in Finland

Tammisaari Teacher Training College, established in 1871, was both the first teacher training college for women and the first Swedish-language teacher training college in Finland. The Uusikaarlepyy Men's Swedish-language Teacher Training College was set up two years later, in 1873. After Jyväskylä, the next Finnish-language teacher training college was established in Sortavala in 1880 to meet the educational needs of Eastern Finland.

Before the turn of the century, three more Finnish-language teacher training colleges were founded: the Raahe Women's Teacher Training College and the Rauma Men's Teacher Training College in 1896, and the Heinola Women's Teacher Training College in 1899. The Kajaani Men's Teacher Training College was established in 1900. The colleges were set up in small towns in different parts of the country. Because the aim was to civilize the whole nation, new colleges were created far from the old ones so as to make sure there were teachers graduating from all parts of the country. Halila noted that the most significant of the new colleges was Heinola Teacher Training College, thanks to its young and enthusiastic leader, Mikael Soininen. Today (1998) its former buildings accommodate a training centre operating under the National Board of Education established on August 1, 1972, when the college was abolished.

After almost half a century, there were still new teacher training colleges being set up. Those were Hämeenlinna Teacher Training College in 1947, the Kemijärvi Men's and Women's Teacher Training College in 1950, Tornio Teacher Training College in 1951, and the Savonlinna Women's Teacher Training College in 1952. In addition to the training colleges, teachers were also being educated in teacher education colleges operating in Helsinki (established in 1947), Turku (1949), and Oulu (1953).

In the early 1970s, both the teacher training colleges and the teacher education colleges were abolished. The colleges of Hämeenlinna, Kajaani, Rauma and Savonlinna were attached to universities, becoming teacher education departments.

After the Second World War, around the mid-1940s, the demand of industry for technical skills started to increase rapidly. Technical knowledge and skills were necessary for all citizens in an increasingly mechanized. This need had to be met also by general education. In 1957, modern secondary school was introduced as an extension of primary school. Practical subjects were emphasized: the aim was to give the stu-

dents pre-vocational education by teaching them basic technical skills. Modern secondary school teachers were mainly folkschool teachers who had graduated from one of the teacher training colleges, or professionals of the technical field who had been given some pedagogical training.

In Lahti Home Crafts Teacher Training College, and in Hämeenlinna Teacher Training College, special courses were organized where folk-school teachers were trained to be handicrafts teachers in modern secondary schools. The training took a few months, and consisted mostly of vocational and pedagogical courses aimed at home crafts teachers, technicians and engineers. In 1958, it was enacted that the qualifications for the post of a handicrafts teacher in modern secondary school were a certificate of graduation from the Woodwork Section in Lahti Home Crafts Teacher Training College, and the completion of lower secondary school. Later, in 1963, Rauma Teacher Training College was to have a role of its own in this type of training.

HANDICRAFTS TEACHING IN RAUMA TEACHER EDUCATION DEPARTMENT

The education of handicrafts teachers began to centralize in Rauma when special courses for handicrafts teachers, similar to those offered in Lahti and Hämeenlinna, were started on June 4, 1963. The decree on educating handicrafts teachers for boys in Rauma Teacher Training College was given on May 5, 1963. The training took four years. The town of Rauma gave the facilities of the modern secondary school for the use of the college. Thus the work began, and in the autumn of 1963 started the four-year training of boys' handicrafts teachers that would qualify the students to work as subject teachers in folk school. There were still one- and two year courses in Rauma for home crafts teachers and technicians that gave qualification for the posts of wood- or metalwork teachers and teachers of machinery and electricity in modern secondary school. Also, folk-school teachers with excellent marks in handicrafts were given training comprising two summer courses and one pedagogical winter course to gain qualifications for working as teachers of woodwork or metalwork, or of machinery and electricity.

A separate decree on the qualifications and training of modern secondary school teachers was issued on April 30, 1964 (30.4.1964/225). Section 29 of the decree described the different training programmes offered in Rauma Teacher Training College. According to this section, the education of teachers of woodwork, metalwork, and machinery and electricity started on August 1, 1964. At the time, it was also possible to qualify as a handicrafts teacher of some type for modern secondary school from the University of Oulu and from Jyväskylä College of Education, as well as from the teacher training colleges of Hämeenlinna, Itä-Suomi, Savonlinna, Tammisaari and Uusikaarlepyy.

In 1967, a Handicrafts Teacher Section

was set up in Rauma to complement the Class Teacher Section. New posts for teachers and lecturers were also created through decrees, which also described the qualifications of teachers. Thanks to the new section, the posts of the teachers needed for educating subject teachers of technical handicrafts in the college were filled.

In 1970, a four-year course in teaching technical handicrafts intended for upper secondary school graduates was started in Rauma. The course prepared the students for the posts of technical handicrafts teachers in both primary and secondary school. Thus, Rauma Teacher Training College, later Rauma Teacher Education Department, gained a leading position in educating boys' handicrafts teachers and has, since the early 1970s, exerted practical influence on the development of the training of subject teachers of technical work.

The new decree on teacher education was passed on June 6, 1973. Teacher training was provided in departments of teacher education under university faculties of education. The qualification requirements for teaching posts in the teacher education departments were also defined in the decree. The private University of Turku that was established in 1922 became a state institution in 1974. Education became a major subject in the education both of technical handicrafts teachers in Rauma, and of textile crafts teachers in Helsinki. A professorship in education, with special emphasis on handicrafts education, was created in Rauma in 1990. There had been an associate professorship in Rauma since 1974.

OTHER PLACES AND FORMS OF TRAINING HANDICRAFTS TEACHERS

When Finnish universities introduced the credit-based system of monitoring course completion, it became possible in teacher education to complete courses corresponding to academic degrees. These minor-subject studies can be undertaken in all subjects taught in comprehensive school. The 35-credit course that is to be taken if only one minor subject is chosen gives the student an additional degree, and eligibility for the post of a subject teacher of the subject of his minorsubject studies. This possibility has been taken advantage of in many teacher education departments in Finland. By 1997, the 35-credit course in technical handicrafts has been included in the curriculum in six teacher education departments. The students completing this course qualify also as subject teachers of technical handicrafts in secondary school.

The University of Oulu began looking for new ways of developing the teaching of techical handicrafts. With permission from the Ministry of Education, special courses were organized in technical handicrafts in 1992–1995. Several faculties were involved in the planning of the degree programme for subject teachers of technical handicrafts. The programme was coordinated by a fixed-term lecturer in technology education. A college of professors was responsible for the scientific standard of the programme, which made it possible to give the students eligibility for the post of a subject teacher of technical

work. The students on these courses were mainly (class) teachers who completed the course on an average of two years of study. The courses were designed to meet mainly the needs of Nothern Finland.

In 1996 a new type of education for technology teachers was started in Oulu Teacher Education Department. For this purpose, Oulu has since 1995 had an associate professorship in education with emphasis on technology education. The students admitted to this class teacher education programme will complete 35-credit minor-subject studies in technology education. This qualifies them to teach technical handicrafts in lower and upper secondary school if they take technical handicrafts under the name of 'technology education' as their minor subject.

Girls' handicrafts teaching has a longer history than that of boys'. In general education, girls' handicrafts has been included in the curriculum ever since Finland was a part of Russia. From Cygnaeus' time on, teacher education in this field has been organized in the Helsinki Handicrafts Teacher Training College. In 1991, the old content subject, textile crafts, was replaced by a new degree subject, textiles, clothing and craft design studies. It covers the processes of design and production in handicrafts. The introduction of this new degree subject is intended to bring about an integration with the educational institutions offering training in craft design. Apart from Helsinki, textiles, clothing and craft design studies can also be studied in the Teacher Education Department of the University of Joensuu in Savonlinna.

The Swedish-language education of teachers of both technical work and textile work is provided by Åbo Akademi in Pohjanmaa College (Österbottens högskola) in Vaasa. The associate professorship in handicrafts education (*slöjdpedagogik*) that was created in Vaasa in 1995 became a full professorship in 1997.

2.3 The qualification requirements of handicrafts teachers

There is very little research on handicrafts teaching for boys covering the early years of folk school from 1866 onwards. In fact, handicrafts was not a compulsory subject for boys in urban schools and those concerned did not always officially acknowledge the possibility of providing it.

In 1890, the requirements for teaching handicrafts were defined as follows: handicrafts teachers were to have a certificate, given by a lecturer at a relevant teacher training college, stating that the teacher had the knowledge and practical skills needed in the subject.

Section 54 of the 1957 Folk School Act prescribed that there was to be a special teacher of boys' handicrafts in every folk school where, from the third grade up, there were more than 30 classroom hours of instruction in boys' handicrafts, the compulsory teaching load of folk school teachers.

On April 30, 1964, a decree amending the Folk School Decree was passed. The decree includes a list of folk school teacher posts. Seven of the posts involved, partly or exclusively, boys' handicrafts. Those were the positions of teachers of woodwork, metalwork, combined woodwork and metalwork, machinery and electricity, metalwork including machinery and electricity, woodwork and metalwork including machinery and electricity, and agriculture and forestry including machinery and electricity. It was possible to gain qualifications for all these posts in Rauma Department of Teacher Education.

In the 1970 Comprehensive School Decree handicrafts is included in the curriculum of primary school. In the secondary school, handicrafts is included with some restrictions. Woodwork, metalwork, and machinery and electricity are included in the secondary school curriculum as elective subjects. Apart from the general qualification requirements, in primary school a teacher of boys' handicrafts needed a degree in teaching handicrafts from Rauma Teacher Training College, or completion of comprehensive school or of the old academic lower secondary school together with a certificate from the Woodwork Section of the state-owned Home Crafts Teacher Training College. Those qualified to teach woodwork in modern secondary school were also eligible for the post. This applies only to subject teachers in primary school, as class teachers were allowed to teach handicrafts both to their own class and to any other class. Section 103 of the above-mentioned decree states that secondary schools may have posts for teachers of woodwork, metalwork, and ma-

chinery and electricity. According to Section 119, any person with eligibility for corresponding posts in modern secondary school qualifies also for those in comprehensive school.

A teacher of technical subjects required qualifications for teaching woodwork, metalwork, and machinery and electricity. A person with qualifications for one or two of the subjects mentioned above could gain eligibility for the post through further training prescribed by the National Board of General Education in the subject(s) in which he did not qualify as a modern secondary school teacher. Such further training was given in Rauma Teacher Training College in summer.

There were grammar schools in Finland long before Cygnaeus created the folk school system. The children of families with limited means were rarely able to attend grammar schools. Grammar schools were parallel schools up until the comprehensive school was introduced. There were both private and state-owned academic lower secondary schools (*keskikoulu*, "middle school", in Finland covering ages 11–16) or combined lower and upper secondary schools (*lyseo*, *lyceé*), usually entered from the fourth grade of folk school.

3 HANDICRAFTS FACILITIES AND PRODUCTS IN SCHOOLS

3.1 The history of handicrafts facilities

There has been great variation between municipalities and schools as regards the changes and developments that have taken place in handicrafts facilities in the course of the subject's history. In recent years, it has not been considered worthwhile in small municipalities to improve old teaching facilities because of the small number of pupils using them. In teacher training colleges and in the present teacher education departments the situation has been better. This has given future teachers the opportunity to receive a good education and to learn at first hand what are the preconditions of good handicrafts teaching.

In most Finnish schools, the handicrafts facilities were either inadequate or nonexistent in 1884–1885, when the Cygnaeus Committee started planning handicrafts teaching in folk school. According to statistics, out of the 497 rural folk schools in Finland only 163 had a separate room assigned for the teaching of handicrafts. Furthermore, some of these rooms were too small to be suitable for their purpose. Cygnaeus proposed that, in order to overcome this problem, loans should be granted from public funds to every school district that commits itself to building adequate handicrafts facilities using drawings approved by the National Board of Education.

In the report of the Soininen Committee (1912), the 'handicrafts room' and its furnishing is discussed critically. Placing carpenter's benches in small rooms of 40–50 square metres was problematic because of the large numbers of pupils attending the lessons. For example, the statistics show that in 1909–1910, in 175 schools there were from 31 to 50 pupils per lesson. The aim of the National Board of Education was to have classes no larger than 30 pupils. This alone required 30 carpenter's benches if one-sided benches were used. In the early days of handicrafts teaching, the carpenter's benches were located in the school assembly hall that, at the time, was often also used for gymnastics. The benches could be hinged to the walls or set up in 'planing towers'. It is still commonplace in small rural schools that the facilities for handicrafts teaching are shared with other subjects. More advanced versions of the hinged car-penter's benches are the collapsible

hobby-type working stands. They do not need a great deal of space and are easily put into storage.

HANDICRAFTS MATERIALS

The storing of handicrafts materials was a problem. The main material was timber. The timber used was mostly birch because of its suitability for household use. Birch is also durable and thus highly suitable for making tools and agricultural equipment. However, timber must be seasoned before use. Unseasoned timber changes its shape when drying, and it cannot be glued or painted. In most cases the timber was stored and seasoned on the ceiling rafters of the handicrafts teaching room over winter. Because the room was heated, the timber was seasoned but, unfortunately, it also gathered a great deal of dust that was difficult to remove. When handicrafts faculties were developed, a type of stall was introduced where the timber, planks and boards, could be stored endwise.

Nowadays, it is possible in many places to provide schools with seasoned timber. It is also a good modern solution to have boards of laminated wood in different thicknesses at school; it is an easy material for producing designs of one's own , even by using handicrafts tools. In addition to this, other boards made of wood (eg chipboard, plywood and different kinds of fibreboard) are taking the place of massive timber at schools.

In the early days of handicrafts education, before the Soininen Committee report, metal was relatively rarely used at schools. In many places this has continued to be the case even to this day. Thus, the storing of metals has caused no problems. There have also been difficulties with joining metal materials. However, it is not necessary to have welding equipment at school, as metals can quite easily be joined with glue, rivets, different screws and joints or by soldering. It is possible today to get firm soldering seams using tin and other metals with a low melting point.

HANDICRAFTS TOOLS, INSTRUMENTS AND MACHINES

Due to the schools' lack of funding, equipping schools with tools and other implements had not received much attention. Even though a committee that sat from 1884 to 1886 had made a list of the equipment needed in the handicrafts facilities, very few schools had actually acquired them. There were not enough tools for the pupils' individual work. This caused waiting and inflexible instruction. The Soininen Committee proposed that each pupil should have at least a frame handsaw and a bench plane for personal use. The committee also suggested that there should be a sheath-knife, a hammer, a chisel and an engraving tool for every two pupils to share. Tools that the whole class shared were the axe, the glue pot and the whetstone. A lathe,

a grindstone and a file bench were also assumed to be included in Finnish schools' handicrafts equipment.

Even though wood-turning might not be calculated to develop quite those skills that are needed in today's world of rapid technological development, the lathe is still included in most Finnish schools' handicrafts equipment. The reason for this is that the lathe has been a part of Finnish schools' equipment since the early stages of handicrafts teaching. Many early educationalists in Western and Central Europe have thought wood-turning valuable in schools from as early as the 17th century. In England, for example, John Locke considered woodturning educative. In Finland, wood-turning was included in the model sets defined in the 1887 report of the Cygnaeus Committee. The report stressed the importance of acquiring carpenter's benches and a turning machine to schools.

The Soininen Committee was concerned about the pupils' possibilities to continue their interest in handicrafts after school. There were few crafts tools in the homes at the time. The committee suggested that when they left school the pupils should be given blades for the tools they had made. For instance, making the wooden parts of a frame handsaw was part of the curriculum. Wooden planes were also made. It was thought that giving the pupil a blade for the plane would make him persist with the diligence he had learnt at school. It was suggested that schools should organize social evenings in order to collect money towards the purchasing of the blades. Teaching pupils to save up was also seen as a way to achieve the aim. There were few jobs available at the time, especially in the countryside. Setting up a workshop was a way of earning one's livelihood. This was in harmony with Cygnaeus' ideas about the connection between school and economic life. Thus, the viewpoint of entrepreneurship education was involved in all this – a viewpoint that is today a central theme in the teaching of technical work.

The next major changes in the facilities of handicrafts teaching came after the Second World War, in 1954, as a result of the report of the Committee on Teaching Handicrafts in Rural Folk Schools. The war indemnities required the Finns to learn new skills. Woodwork alone was not enough anymore. Metalwork skills became important as the war indemnities to be paid to Russia included ships, different machines and instruments. At this point, machinery and electricity were included in the curriculum. This brought up the need for new facilities. All the subject areas taught in modern secondary school were also assigned a specialized subject teacher of their own.

In 1975, the school subject 'handicrafts' became 'technical handicrafts' in primary school and 'technical work' in secondary school. Thus, the names for the different areas of handicrafts that originated in modern secondary school, and that in comprehensive school featured as names of elective subjects in 1970–1975, were combined in a single term. Overall, space requirements diminished

as one teacher was now qualified to teach all areas of the subject.

The planning of comprehensive school and of the facilities for technical work have been guided by the National Board of Labour Protection and, more recently, by the instructions, standards and regulations of the National Board of General Education. Individual schools have, however, been able to vary the basic designs as long as they do not exceed the stipulated room area limits. Affluent municipalities, such as the city of Helsinki, build their school facilities completely without government subsidies and are therefore able to give teachers more responsibility for the planning process.

The first edition of the National Board of General Education's handbook on occupational safety in handicrafts was published in 1972. In addition to directions concerning space requirements, there was a great deal of information on safety considerations in technical work. Attention was also paid to the maintenance of the workroom. Revised editions of the handbook were published in 1974, 1977 and 1989. The latest version, edited and published in 1994, includes regulations covering all aspects of occupational safety in handicrafts. The regulations for technical work, however, have remained exactly the same as in the previous editions.

All in all, it can be said that at least the resources available to teaching handicrafts have clearly improved over the years. The comprehensive school system has evened out the great differences that used to exist between different school forms. The closing down of small rural schools has meant a step forward at least in the teaching of technical work because in population centres the facilities have always been better than in the fringe areas of municipalities.

3.2 Products made in handicrafts teaching

This chapter describes the type of curriculum that has been followed, in the past forty to fifty years, on the basic courses in technical handicrafts offered by Finnish teacher education establishments. The information is based on inquiries made in all departments of teacher education in 1995–1996, and on written sources. In recent years, the aim in teacher education has clearly been to develop handicrafts teaching in the direction of technology education, away from the simple making of artefacts, today largely a historical aspect of handicrafts teaching. Working on a project to solve technical problems instead of merely producing artefacts is growing more commonplace in comprehensive school as well. Such a project might result in a product, but that is not its objective. Instead, the point of the project is solving the given problem. More often than not, project work is carried out in groups.

The following paragraphs are a classified listing of the artefacts made, according to the inquiries alluded to above, during training in technical work. The lists include the most frequently mentioned materials and objects.

Artefacts made of wood: cupboards, shelves, stools, trays, penholders, carving boards, caskets, bird tables, toy cars, scale models, cheese moulds, musical instruments, lathe products, toilet glasses, candle lamps, candlesticks, butter knives, briefcases, game boards, weather vanes, toy animals and masks.

Artefacts made of metal: Water ladles for the sauna, fire irons, sausage sticks, coatracks, hanging flower and candle pots, sconces, biscuit forms, sheath knives, tankards, bow files, toys, belt buckles, bells, wire works, whistles, pokers, bookstands, handles, and themes and projects introducing students to modern technology.

Artefacts made of plastic include: of acrylic plastic were made cases, boxes, stands, basins, coatracks, frames, key rings, egg cups, boats, containers, bookstands, and prototypes. Other types of plastic, such as reinforced, ethene and styrene plastic were also used.

Among other materials most commonplace were electronic components, different electronic assembly kits, and computers. Leather, enamel, and rattan were occasionally mentioned, natural materials (lichen, moss, tree twigs, wood chips and stones) were used more rarely. Model aeroplanes and waste tins were also mentioned. The last item suggests that environmental education had been taken into consideration.

The inquiries mentioned above covered also the the artefacts made during the minor-subject studies included in teacher training programmes. The present minor-subject studies correspond to the former specialization studies and and extended courses in subject studies. The artefacts made and materials used in the minor-subject studies were as follows:

Artefacts made of wood: pieces of furniture, such as cupboards, tables, shelves, chairs, stools, boxes, panel works using massive timber and chipboard. Other products include, for example, briefcases, strongboxes, intarsia work, objects for interior decoration schemes, lathe products, and objects made as project work.

Artefacts made of metal included: the most commonplace were forging, wood-turning and welding products. Among the objects made were tube products, sheath knives, lanterns, fire irons, barbecues, bells, toys, candelabra, handles, bookstands, hinges, and weather vanes.

Artefacts made of plastic: acrylic plastic was heat-shaped and bent into cases, boxes, stands and toy cars; PCV and polystyrene was used in making knick-knacks. One teacher training department had made water scooters by laminating reinforced plastic. Some departments reported assigning their students practically the same tasks as those included in the basic course but setting them higher demands.
Other materials include computers, camcorders, mechanics and electricity materials, electronic assembly kits (Lego-Logo, Fischer and Unistep); enamel, leather, stone, glass, bone, and birch bark works were also mentioned.

The tasks assigned as part of minor-subject studies, like those set in basic studies, largely corresponded to the training sets. However, in minor-subject studies there has been a far greater variety of artefacts. This is due to the greater amount of time allocated for minor-subject studies, and also to the students' mastery of basic skills and techniques after completing the basic course, which enables them to specialize more freely.

4 TRENDS IN THE DEVELOPMENT OF THE TECHNICAL WORK CURRICULUM

4.1 Cygnaeus and the development of technical work in Finland

Cygnaeus' ideas were put into practice in Jyväskylä Teacher Training College where the aim was versatile teaching of handicrafts. Especially Yrjö Blomstedt's lectureship was characterized bt creative design and fine results. During this period, in 1889, the second-year male students gained a second prize at the Paris World Exhibition with their handicrafts collection.

In addition to handicrafts, Cygnaeus also developed other teaching connected with industrial life. The curriculum of the Jyväskylä Teacher Training College included, for example, agriculture and gardening. The latter was practised in the College garden that can still be seen on the campus of the University of Jyväskylä. Cygnaeus' ideas correspond to a great extent with the present trend towards technology education and links with industrial life. Applied science, product design, and entrepreneurship education are important in technical work. Cygnaeus' attempt to change the name of the subject to 'technical handicrafts' was forward-thinking.

There were only minor changes proposed to the teaching of handicrafts in the 1952 curriculum for folk schools. Pupils were allowed more say in the choice of tasks and more freedom in carrying them out. The name 'handicrafts' was re-introduced and metalwork was included in the curriculum. The report of the Committee on Further Education in Rural Folk Schools (1954) was much more progressive.

The regulations applying to folk school were assembled into a law and a number of decrees, and the Folk School Act was issued in 1957. The act divided folk school into six-year folk school and a two-year modern secondary school. Under certain circumstances, modern secondary school could be an one-year institution and folk school a seven-year one. Later it became possible for municipalities to organize a voluntary ninth grade in modern secondary school. This is how the previous continuation school or became modern secondary school that up until the 1970s operated as a parallel system to grammar school.

The curriculum of modern secondary school included many subjects and exercises that were, from the point of view of handicrafts teaching, closely linked with industrial life. Handicrafts teaching was strongly influenced by John

Dewey. He suggested that school should be a miniature society in which production processes, especially those involved in agriculture, were studied. Accordingly, handicrafts teaching in modern secondary school aimed at developing skills needed in the maintenance of agricultural equipment, tools and household equipment. Modern secondary school was divided into separate lines of study. There was, for example, a 'technical line' that was meant for boys. Its aim was to serve those interested in factory work or home crafts and in the driving, repairing and servicing of cars.

Comprehensive school was introduced in Finland as an experiment in 1968, when it was started in Northern Finland. The curriculum guidelines for technical work further increased the diversity of its educational content. The general spirit of the new guidelines was distinctly more polytechnic than that of the previous curricula. The application of theory into practice and cooperation between school, working life and industrial life were emphasized. After many phases of development, it is only in comprehensive school that it has actually become possible to realize Cygnaeus' ideas. Preconditions for this were created by the increased prosperity of Finland after the Second World War. The goals that Cygnaeus set are now being reached also in the new curriculum guidelines. Comprehensive school has made educational contents more diverse and put stronger emphasis on creativity. In the early objectives of handicrafts teaching in comprehensive school, art education was also foregrounded. The goal was to promote creative thinking in all possible ways.

Technology was emphasized in the teaching contents of comprehensive school. Electronics were first introduced in the curriculum through curriculum guidelines in 1977. Control systems and techniques, and mechanics and electricity already introduced in modern secondary school, were emphasized. The increasing amount of leisure time was taken into account by making interest-related elements a part of the curriculum. This period saw the beginning of a slow weakening of the dominance of woodwork in teaching contents.

Comprehensive school also brought about changes in the didactics of technical work. The greatest innovation was the introduction of theme work based on problem-solving, which took place right in the beginning of the transitional stage between folk and comprehensive school in the early 1970s. At the time, the theme work method was used in all teacher education departments. In schools, however, the new method was adopted more slowly. It was often only brought to use as young teachers replaced old ones. The names of the subject, technical handicrafts in primary school and technical work in secondary school, indicate that the emphasis was on technology. Handicrafts was officially one of the practical subjects, later of the practical and art subjects, and thus had connections with aesthetic education. The examining of functioning instruments and machines, on the other hand, was linked with science teaching.

Cygnaeus' versatile idea of technical handicrafts might have been too modern for the Finnish society of his day. An examination of the history of handicrafts teaching shows that without national heritage the reforms had very little chance of being realized. Over the years the ethical goals of education have, however, given way to the versatile development of the pupil's personality. Cygnaeus' aim to foster the pupils' creativity and thinking skills together with dexterity have evolved into the goal of developing versatile skills in handicrafts, design and, above all, problem-solving. Cygnaeus' ideas are still alive today. The main objective is to bring up fully developed human beings, and it is in achieving this objective that technical work has an important role.

Cygnaeus' farsightedness is evident in his views on the importance of technical education to all citizens, regardless of gender. This emancipatory message is too clear to be denied even today.

TECHNOLOGY EDUCATION

The technological development of society demands novel skills from all citizens. These skills include the ability both to use applications of technology and to influence the way in which technology develops. The changes in the name of handicrafts as a school subject indicate the varying demands that society has placed on handicrafts teaching. At the early stages, practical skills were needed in producing utility articles. Later on, as industry developed, it became necessary to give the pupils a grounding for training as skilled workers and technicians of various kinds. Today, technical literacy and general technological competence are needed in order to understand technical apparatuses.

On a global level in developed industrial countries, the latest main trend in handicrafts teaching as part of general education is technology education. The main idea of technology education is that understanding the structures of technology and taking part in decision-making on how technology is used should be part of a general education. If this is achieved, all citizens may be expected to gain a basic technical education and become technologically literate. There have been proposals in Finland to turn handicrafts into technology education. Ever since the early 1970s, when the National Board of General Education organized some experiments in technology education, there have been efforts to include technology in the school curriculum.

In the latest curriculum for comprehensive school, basic education in technology is considered necessary. The term 'technology' is mentioned in several places in the document. However, instruction in technology has not been included in any one subject. Its development has, nevertheless, continued in handicrafts through the development of technical work. In comprehensive school, technological contents have thus been considered as an aspect of technical work.

From the perspective of both the historical and the future development of the subject this is only natural, as facilities have already been established throughout the country. The development should, however, be guided in a more technologically oriented direction. In many teacher education departments and in some comprehensive schools, the importance of the issue has been understood and technology education has been incorporated into the curricula. In many studies on the teaching of technology, subject strategy is seen in an even wider perspective. They argue that the new perspectives incorporated into technological education have made it relevant to all subjects. Examples of these perspectives are: 'technology as a part and a goal-defining element of culture', 'the humanistic and ethical viewpoint in technology (ethics of technology)', ' technological structures as part of environmental education', 'lifespan thinking and recyclability in product design', and 'technology and entrepreneurship education at school'.

When upper secondary school was reformed in Finland, there was some discussion about including practical subjects in the curriculum. It was thought that training in dexterity should continue also after comprehensive school. The National Board of General Education had a working group planning technology teaching that wanted to introduce general technology teaching into comprehensive school, upper secondary school and in teacher education from 1997 onwards. The arguments for developing instruction in technical subjects into instruction in technology presented by the working group include the following:

The need for theoretical and intellectual skills in education and working life has increased. Working life changes rapidly, and the specific demands it sets for employees can no longer be met through general education. At the same time, the skills today required in a particular job involve practical know-how. Gaining an understanding of technology is important from the perspective both of the new educational objectives and of the development of skills.

The latest curriculum for upper secondary school (1994) discusses technology at great length. A broadly based general education, defined as encompassing values and the central areas of culture, is regarded as important. The documents lists the knowledge fields comprising a modern general education as follows: technological, mathematical, scientific, humanistic and social fields. It is interesting that technology should be placed first. Nevertheless, there are very few upper secondary schools in Finland that offer technology education in their curriculum. The only technical upper secondary school in Finland is in Nastola.

For technology education to be seen as a natural need it should be studied all the way from the first grade to graduation from upper secondary school. In some countries technology education starts in kindergarten. For example, the United States has underway a project called *Technology for All Americans*. The project

is creating standards for technology education in all age groups starting from kindergarten.

In primary school in Finland, technology education is easy to incorporate into the themes of integrated teaching. If technology is made the central subject, all the subject areas mentioned above can be included in its contents. This would also help to implement integrated teaching. In secondary school the pupils can specialize according to their interests. In upper secondary school technology education project learning may be foregrounded. The subject must be further integrated into science and information technology. If a Technological Matriculation Examination cannot be introduced, a final assignment on a technological subject must be included in the interdisciplinary upper secondary school projects. This final assignment can help the pupil decide the direction of his or her further studies. The aim of providing pupils with a general technology education should be a an all-round and solid grasp of technology.

4.2 Technical work in the last decades

Up until 1970, the subject was called 'boys' handicrafts. In modern secondary school handicrafts was divided into woodwork, metalwork, machinery and electricity, and technical drawing. In grammar school, boys' handicrafts, previously also woodwork, was usually taught up to the third grade. A comprehensive school system was gradually introduced in Finland from 1968 onwards. In comprehensive school, wood- and metalwork, machinery and electronics, which had been taught in modern secondary school, became elective subjects offered in the eight and ninth grades. In the sevent grade they formed a joint subject. With textile work divided in much the same way, the division between genders remained, with boys choosing technical work and girls textile work. Technical drawing was made a special course. The name of the subject was 'technical handicrafts'. The second report of the Comprehensive School Curriculum Committee (1970) stated that it was important to use administrative means of sufficient power to ensure esteem for the elective subjects and guarantee the status of the teachers of these subjects. Disregarding this statement, the Government gave in 1975 a set of instructions for reorganising the operational structure of comprehensive school. The decision, made on mainly economic grounds, abolished all appellations for the different component fields of handicrafts and removed all special courses from the distribution of classroom hours. It also raised the minimum number of pupils required in elective subject classes. The name of the subject was changed to 'technical work'. It is still possible to study, in the eight grade, either two or four weekly hours of the previously mentioned subfields of handicrafts.

In primary school the corresponding subject was called 'technical handicrafts' until 1985, when it became 'technical work' also in grades 3–6. Since 1994, in secondary school and in the seventh grade the name of the subject has been 'handicrafts'. It covers the teaching contents of technical work and textile crafts. The curriculum stipulates that all students are to be taught handicrafts in grades 1–3 and 7. According to the 1994 Framework Curriculum of the Comprehensive School , handicrafts is a subject common to all pupils regardless of their sex in grades 1–7.

In teacher education departments, handicrafts may be included both in basic and in minor-subject studies. There are differences in emphasis as regards both teaching hours and educational contents. In Jyväskylä Department

of Teacher Education all class teacher trainees have since 1995, as stipulated in the Framework Curriculum of the Comprehensive School (1994), taken courses in both technical work and textile crafts. Accordingly, in handicrafts there has been room for personal choices only in elective and minor-subject studies.

Thus, technical work has been taught in secondary school since 1975. In the official Finnish statistics 'technical work' refers to 'work, control and inspection tasks in the field of technology'. This gives us guidelines for defining technical work as a school subject:

Technical work is a subject included in general education where pupils are introduced, through practical activity, to the world of work and to technology. It also provides them with knowledge, skills and attitudes that
help them to cope in working life and in an increasingly technological society.

This definition marks the direction in which modern handicrafts education is to be developed. Emphasis is laid on technical and technological skills. This is characteristic of technical work. However, it is important to remember, while teaching technical skills and technology, that there is no development without history. Traditional craft work and traditional handmade objects are also a vital part of the history of technical work.

INTEGRATING TECHNICAL WORK AND TEXTILE WORK: PROBLEMS

As this is being written, new school acts are being debated in Parliament. The Secretary General of the Ministry of Education and the chairperson of the committee that prepared the reform of school legislation regard, surprisingly enough, equality as the basis of the new act. In this context, deciding on the future of handicrafts teaching seems problematic. Different interest groups have demanded the integration of technical work and textile work on the very basis of gender equality. However, it is unlikely that equality can be reached under the present subject names. Only a new subject name could create a neutral frame of reference that could bring about improvement also as regards equality. This would achieve one of the aims set for comprehensive school.

Despite the fact that it was stated in the 1994 Framework Curriculum of the Comprehensive School that technical work and textile work form a pair of subjects that is meant for all pupils, pupils still choose one or the other along gender lines. The legislators have insisted that the names 'technical work' and 'textile work' must be abandoned and the simple 'handicrafts' adopted instead.

Kaukinen, a professor of textiles, clothing and craft design studies, has noted the problems brought about by the present situation. Kaukinen sees the issue of equality, the basis of the new school act, as one of the problems in

handicrafts teaching. She points out that when two subjects with different substances are combined under the same term, the appellation can not remain exactly the same either. Technical work is oriented towards technology, whereas textile work is oriented towards art history and ethnology. Equality is realized when pupils are able to study both subjects. In this case, technical work would be turned into a subject called technology education while textile work would include the contents described above. Internationally, the experiences from such a solution, based on the example of home economics, have been encouraging. Thus it seems that it has finally become necessary to change the subject name.

THE FUTURE OF HANDICRAFTS

At the moment, one of the objectives in handicrafts teaching is to help the pupil gain competencies needed in coping with everyday life, job assignments, and hobbies, and to guide him or her towards post-compulsory education. Traditionally, learning in handicrafts is largely based on producing things, as is stated in the *Framework Curriculum of the Comprehensive School.* The learning process usually results in a product. An alternative approach would be emphasizing the process during which technical problems are pondered on and solved. This approach is foregrounded in technology education. When considering the development from handicrafts to technology education, it is worth asking ourselves what kind of citizens are needed in Finland in the future.

If the potential benefits of teaching handicrafts or technology are to be taken advantage of in the future, the subject should be given objectives, contents and methods better in keeping with the needs of today's society. Instead of dexterity it would be better to talk about the skills involved in using one's hands. Naturally, such skills include also thinking skills.

Developing technical work in the direction of technology education is vital for Finland's economic advancement. Technology education should be considered a challenge to both technical universities and teacher education. By updating the educational contents of technical work the subject can be developed so as to meet the expectations of society and master the changes required by successful development work.

As part of his research on technological competence in general education, Parikka (1998) looked also at the potential of technology education to improve gender equality. All the 32 experts that participated in the inquiry were of the opinion that in upper secondary school for example technology education should be provided to all students regardless of gender.

It would make developing handicrafts as a school subject easier if the name 'technical work' was replaced with 'technology education', as has been done in many developed industrial countries. More precisely, the name of the subject should be 'technology and education' but

as a name for a subject substance it would be cumbersome. 'Technological education', on the other hand, describes the subject better. It also affords better opportunities for far-reaching integration with mathematics and science. If the name 'technology education' will not make it to the new School Act, technical work has to be developed as an individual subject because integration with textile work will not lead to results that would be positive from the point of view of technical work. Integrated teaching and integration between individual subjects makes it possible to also cover important matters that are not included in the contents of any specific subject.

There are, throughout secondary school, several possible avenues of integration with different subjects open to technical work, and they should be explored further. Because technical work is based on practical activity, it can be an important factor in introducing meaningful learning by doing to other subjects. Equality can be achieved even if everything is not integrated into a subject taught to everyone. The best way to achieve equality is to offer a variety of options which enable pupils to make the best possible use of their strengths. This is, after all, what happens in most situations in life that involve choices of some kind. Even today, pupils are able to choose either technical work or textile work according to their preferences.

The rapid development of technology is aptly illustrated by the fact that just a generation ago, the working population in Nokia were mostly industrial workers. Today, the people now working in the area use their heads rather than their hands. Their job description is totally different from that of their parents. The municipal authorities received their schooling in comprehensive school, where instruction in practical skills was no longer part of the curriculum.

The ambitious objective of the Ministry of Education is to make Finland an information society. All schools in Finland are to be linked to the information network. The Ministry has launched a national information strategy project whose objective is to improve the level of education and research in universities and in institutions of higher education in Finland, and to create guidelines for information, knowledge and communication policies in education and research in the 21th century. The focus of Finland's national industrial strategy is on education and technology.

In the future, the ability to use technology, technological competence, will be a part of basic education. Such competence entails the mental capacity and abilities needed in the society of the next millennium, together with reflection on the values involved in them.

Work as an educative element is also still important in comprehensive school. The trend, however, is away from monotonous physical work towards work demanding thinking skills. The process of lifelong learning is becoming more and more important. If Finland is to stay at the top of information and communication technology, there must be a significant increase

in the number of employees trained for these fields. Even now there is a shortage of well-trained engineers in the electricity and electronics industries. Today's young people are thus orientated towards working life through thinking activities rather than by imitating production. Uno Cygnaeus' basic idea 'from education to work through work' is still valid today.

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THE INTERNATIONAL EXPERIENCE OF UNO CYGNAEUS AND THE DEVELOPMENT OF HANDICRAFTS EDUCATION IN THE NORDIC COUNTRIES (TAPANI KANANOJA)

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THROUGH EDUCATION INTO THE WORLD OF WORK

Uno Cygnaeus' efforts in developing handicraft teaching have been internationally acknowledged, and he is considered the father of educative handicraft. 'Through education into the world of work' meant the ability to adapt and use knowledge in one's work. Many of these themes are still central in handicraft teaching today. Thus, as society has evolved, in many countries the teaching of handicraft has developed into technology education.

This book deals with the following themes:
- Cygnaeus' life and his role as a pioneer in educative handicraft
- his international connections
- the history and development of handicraft teaching in the Nordic countries
- the preparation and education of handicraft teachers
- handicraft facilities and products made in schools
- the guidelines in the development of technical education and its curricular implementation in Finland

The writers, all experts in education, share a long history of working together and a common interest in the development of technology education.

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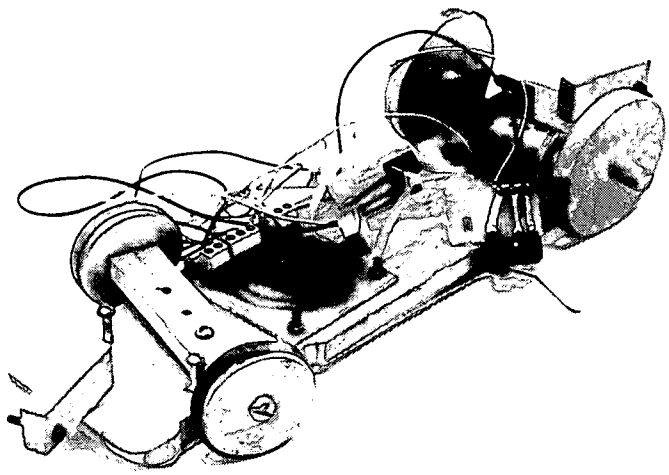

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